

U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION REPORT

8530 OPA

I. HEADING

DATE: 6/2/2000  
SUBJECT: Naples Truck Stop Removal Action, Vernal, UT  
FROM: H. Hays Griswold, OSC Phone: (303) 312-6809  
TO: Director, ERD  
POLREP No.: POLREP 67

II. BACKGROUND

SITE No.: 43P808L008  
Case No.: U940169  
FPN No.: 114009  
D.O. No.: NA  
Response Agency: EPA Region VIII  
Address: 999 18th Street, Suite 500  
Denver, CO 80202  
Response Authority: CWA, OPA (1990)  
Party Conducting Action: EPA (PRFA w/USACE)  
ERNS No.: U940169  
NPL Status: NA  
State Notification: State requested EPA action  
Action Memorandum Status: NA  
Start Date: February 22, 1994  
Demobilization Date: NA  
Completion Date: To Be Determined

III. SITE INFORMATION

A. Incident Category

The incident occurred at an active facility - a Service Station/Truck Stop/Petroleum Bulk Distributor.

B. Site Description

1. Site Description

No change from previous Polreps.

2. Description of Threat

No change.

### C. Evaluation of Site Results

Active treatment was terminated in October 1998 and replaced by a long-term passive phytoremediation system consisting of approximately 300 Sioux-land poplar trees. These were planted down-gradient and cross-gradient of the plume after the October 1998 sampling event. Groundwater sampling from **fourteen** of the sixteen existing monitoring wells was resumed in May 1999, following a six-month pause. This report summarizes the results of the first (conducted 26 April 2000) of three annual rounds of sampling to be performed in 2000.

The analytical methodology used for the latest sampling round was changed to conform to State of Utah Underground Storage Tank (UST) regulations that became final on 1 March 2000. The revised methodology for gasoline contamination adds methyl *tertiary* butyl ether (MTBE), a gasoline additive, and naphthalene to the existing list of required parameters.

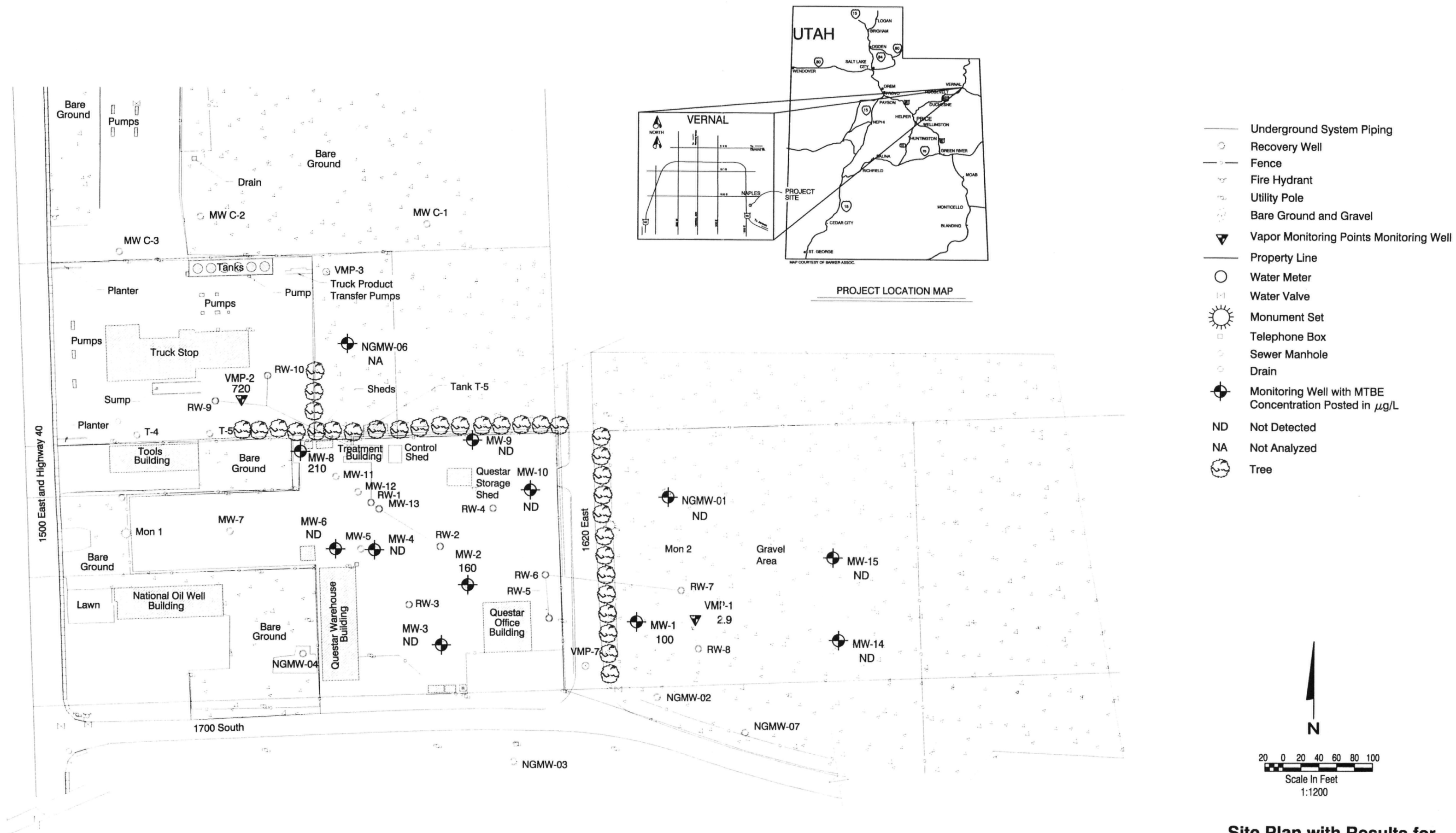
Only 13 of the 14 scheduled wells were sampled. The 14<sup>th</sup>, NGMW-06, a flush-mounted well which lies within a private enclosed yard, could not be found because the property had been covered several inches deep with wood chips. Fortunately, this well is outside the gasoline plume and contamination from this well has not been observed in the past. The well will be located during the next round of sampling using a metal detector if necessary.

Hydrocarbon contamination was found in **seven** of the tested wells. The maximum concentration of hydrocarbons as gasoline was detected from monitoring well MW10 at **18 mg/l**. This well is located in the center of the suspected plume of groundwater contamination. This level of contamination is **higher** than the **14 mg/l** maximum detected value reported in **August 1999** but is lower than the highest post-treatment value (25 mg/l) found at MW-10 in October 1998. Compared to the results of the previous round of sampling, levels of gasoline remained about the same (within 30 percent) in two wells, increased significantly in three wells, decreased significantly in two wells, and remained non-detected in six wells (see Figure 1).

In November 1999, a trace of gasoline (0.03 mg/L) was detected in MW-01 for the first time, suggesting that the plume had moved across 1620 East and past the triple row of Sioux-land poplar trees. The latest results show an increase in the contaminant measured as gasoline to a level of 0.092 mg/l. Even more significantly, the material measured as gasoline appears to be composed entirely of MTBE (0.010 mg/l) determined independently by the UDEQ-approved gas chromatography/mass spectrometric (GC/MS) method. MTBE also appeared in VMP-01 at 0.0029 mg/l. VMP-01 is approximately 60 feet downgradient of MW-01. MTBE was also detected along a line down the groundwater gradient defined by VMP-02, MW-08, and MW-10 (Figure 2).

These results are consistent with a conceptual site model in which MTBE, being much more soluble in water, is moving down-gradient at a much faster rate than the less soluble, less mobile hydrocarbon fraction of gasoline. The leading edge of MTBE has reached VMP-01 while the bulk of the hydrocarbon mass remains largely confined within the main yard of the Questar Pipeline company.





**Site Plan with Results for  
April 2000  
MTBE Monitoring Well Data**  
Naples Truck Stop  
Vernal, Utah



Field measurements of dissolved oxygen (DO) were also made at each sampling location. If bioremediation were active, one would expect an inverse correlation between gasoline and DO concentrations. However the results failed to indicate any correlation, suggesting an absence of significant bio-activity.

Water analysis was performed for gasoline/BTEX/MTBE by EPA test methods SW8015B/SW8021B or for gasoline/BTEX/MTBE/naphthalene by SW8015B/SW8260B. (See Attachment A for the Data Quality Assessment and a summary of results).

#### **IV. RESPONSE INFORMATION**

##### **A. Situation**

<b>Date of Notification:</b>	2/08/94
<b>Date of Discovery:</b>	11/01/93
<b>Date Action Started:</b>	2/15/94
<b>Material Involved:</b>	Unleaded Gasoline
<b>Quantity Discharged:</b>	7000 + gallons
<b>Substantial Threat:</b>	Yes
<b>Resource Affected:</b>	Unnamed tributary to Ashley Creek, tributary to Green River
<b>Source Identification:</b>	Naples Truck Stop

1. **Removal Actions to Date**

Active groundwater treatment was terminated in October 1998 and replaced by a passive phytoremediation system utilizing Sioux-land poplar trees. Planted in November 1998, the trees have survived two winters without significant casualties.

2. **Enforcement**

No change from previous Polreps.

**B. Planned Removal Actions**

Two more rounds of sampling are scheduled for the year 2000. The possibility that the plume has moved across the north-south poplar tree barrier along 1620 East may provide an opportunity to observe the effectiveness of phytoremediation by the end of the growing season, assuming that the root system has penetrated the water table.

**C. Next Steps**

Continue to monitor the groundwater monitoring wells. The next sampling event of the groundwater monitoring wells will occur in the **summer of 2000**. A second round of sampling will be conducted in fall of 2000. Results of all rounds will be evaluated to determine if further monitoring is warranted.

**D. Key Issues**

The table compares levels of gasoline in monitoring wells for **October 1998** with those for **May, August, and November 1999** and **April 2000**.

Well No.	October 1998	May 1999	August 1999	November 1999	April 2000
MW01	ND	ND	ND	Trace (0.03 J)	0.092 J
MW02	0.39	2.0	2.0	1.6	0.32
MW03	ND	ND	ND	ND	ND
MW04	ND	0.78	0.64	0.63	0.64
MW06	0.69	ND	Trace (0.03 J)	ND	ND
MW08	2.2	6.2	3.3	1.3	0.56
MW09	0.11	0.53	0.23	0.11	0.18
MW10	25	13	23	14	18
MW14	0.033	ND	ND	ND	ND
MW15	0.027	ND	ND	ND	ND
VMP01	ND	ND	ND	ND	ND
VMP02	1.2	5.6	3.1	3.1	5.3
NGMW01	ND	ND	ND	ND	ND
NGMW06	ND	ND	ND	ND	NA

ND not detected; NA not analyzed  
All results are in units of mg/L  
The detection limit is nominally 0.02 mg/L  
Note: J indicates that the result is an estimated value

BTEX was not found in six wells – MW03, MW06, MW14, MW15, VMP01, and NGMW01. NGMW06 was not sampled. Naphthalene, analyzed at this site for the first time, was found at 0.0028 mg/l in MW-04 but not detected elsewhere. Compared to August 1999 results, the levels of BTEX and gasoline remained relatively unchanged. The level of gasoline in MW-10 increased from 14 to 18 mg/L, a modest increase over the level observed in November 1999. The contamination first detected in MW-01 in November was identified as MTBE which is migrating ahead of the main plume of gasoline along the groundwater gradient to the southeast. It has crossed the south stand of poplars lining 1620 East. This finding will be monitored closely during the next two rounds of sampling.

## V. COST INFORMATION

Project Ceiling ..... \$ 2,850,000.00

	<u>Costs to Date</u>	<u>Ceiling</u>
<u>Extramural</u>		
TAT	\$ 60,000	\$ 70,000
USACE (Omaha)	\$ 850,000	\$ 1,300,000
USACE (Sacramento)	\$1,574,970	\$ 1,664,721
<u>Intramural</u>		
Direct Reimbursable	\$ 9,000	\$ 30,000
Direct Recoverable	\$ 9,000	

The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report is written. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

### REMOVAL CONTINUES:

H. Hays Griswold, OSC  
1500 hrs, October 5, 1999

c: Rich Haavisto, USACE-Sacramento  
Renee Zollinger, Kleinfelder  
Tom Lae, Jacobs  
Rick Moren, Jacobs

## APPENDIX A

### Data Quality Assessment

#### Introduction

This data quality assessment (DQA) for the Naples Truck Stop fuel spill project is applicable to the analytical results for the following groundwater samples (listed in Table A-1) collected on April 26, 2000.

TABLE A-1 - SAMPLE LOCATION SUMMARY		
<i>Sample Location Name</i>	<i>Sample Location ID</i>	<i>Number of Locations</i>
Groundwater Monitoring Wells	MW01 - 04, 06, 08 - 10, 14, 15, and NGMW01	eleven groundwater (GW) wells
Vapor Monitoring Point #1	VMP01	One GW port
Vapor Monitoring Point #2	VMP02	One GW port

A sample was planned for collection at well location NGMW06. Several attempts were made to locate the well, but due to time constraints and a cover of several inches of wood chips, the well could not be located. The well will be sampled during the next sampling event.

In compliance with the State of Utah's UST rule changes for environmental analyses (see Attachment A), groundwater samples were analyzed for the revised list of gasoline-spill contaminants. At 11 of the 13 locations sampled, benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN) were analyzed following Method SW8260B, and total volatile petroleum hydrocarbons (TVPH) as gasoline by Method SW8015B. At two locations (MW15 and VMP01), benzene, toluene, ethylbenzene, and xylenes were analyzed following Method SW8021B, and TVPH as gasoline by Method SW8015B. In an effort to control costs, naphthalene was not analyzed at MW15 and VMP01 since historically, gasoline has not been detected at these locations.

All method-defined QA/QC requirements specified in SW-846 Test Methods for Evaluating Solid Waste Physical (Chemical Methods, US EPA, January 1995, 3rd edition, Updates I, II, IIA, and IIB) were followed. All groundwater samples were analyzed by EMAX Laboratories, Torrance, CA, a facility approved by the state of Utah for UST-related analytical work.

The data are of acceptable quality and are considered usable to support the U.S. Army Corps of Engineers (USACE), Naples, Utah Truck Stop Project. The precision, accuracy, and completeness objectives for this sampling event were met with noted exceptions. Table A-2 (A & B) shows the sampling and analytical completeness. Completeness is measured in two ways; 1) sampling completeness (samples collected vs. planned), and 2) analytical completeness (percent of acceptable (non-rejected) analytical results vs. the total number of results reported).

## Data Evaluation Process

One-hundred percent of the data was verified by a Jacobs project chemist in accordance with the general principles defined in the Jacobs Data Verification SOP. The following quality control (QC) parameters were evaluated:

- Sample preservation
- Holding times
- Laboratory method blanks
- Trip blanks
- Laboratory control sample and laboratory control sample duplicate (LCS/LCSD) recoveries and precision
- Matrix spike and matrix spike duplicate (MS/MSD) recoveries and precision
- Field duplicate precision
- Surrogate recoveries
- Sample dilutions
- Initial and continuing calibration (as identified in the laboratory narrative)

Analytical results that required the addition of a qualifier flag based on the evaluation process are discussed below. When a result is qualified, a reason code is also added to the affected sample result to indicate the rationale for data qualification. The qualifier flags and reason codes applied to sample results for this project data set are summarized below:

### Qualifier Flags

UJ = the analyte was reported as not detected at an estimated detection limit  
J = the analyte concentration is estimated

### Reason Codes

1 = Sample analyses performed outside of recommended hold time  
T = trace concentration detected above method detection limit (MDL) but below practical quantitation limit (PQL)

### Sample Preservation

Samples were collected in pre-preserved 40 mL VOA vials with the vials appropriately labeled. Prior to sample analysis, the laboratory verified the sample pH. For Method SW8260B analysis, the pH value was greater than 2 for four samples. For samples MW-01, MW-02, and MW-10 FD, the pH was 6, and for sample VMP-02, the pH was 4. For samples that are not properly preserved at a pH < 2, the holding time is reduced from 14 days to 7 days.

## ***Holding Time***

Due to improper preservation of samples MW-01, MW-02, MW-10 FD, and VMP-02 for Method SW8260B analysis, the holding time was reduced to 7 days. All samples were analyzed 3 days beyond the 7 day holding time. For the affected samples, all positive results were 'J' flagged and all non-detects were 'UJ' flagged. Table A-3 provides a summary of the qualified data.

## **Laboratory Method Blanks**

Laboratory method blanks were analyzed in each analytical batch for each analytical method. There were no contaminants detected above the MDL in the method blanks.

## ***Trip Blanks***

One trip blank was collected to confirm that volatile organic compounds (VOCs) were not introduced to the environmental samples during shipment, handling, or storage on site and at the laboratory. VOCs were not detected above the MDL in the trip blank.

## **LCS/LCSD Recoveries and Precision**

LCS/LCSDs were analyzed in each analytical batch for each analytical method. All LCS/LCSD recoveries and relative percent difference (RPD) values were within acceptance limits.

## **MS/MSD Recoveries and Precision**

MS/MSDs were analyzed in each analytical batch for each analytical method. All MS/MSD recoveries and RPD values were within acceptance limits.

## **Field Duplicate Precision**

A field duplicate sample was collected at MW-10 for SW8260B and SW8015M analyses. All RPD values were below the maximum 50 RPD.

## **Surrogate Recoveries**

For Methods SW8260B, SW8021B, and SW8015B, a surrogate was added to each sample to monitor the performance of the analytical system and the effectiveness of the method for each sample matrix. All surrogate recoveries were within the acceptance limits listed in the laboratory Statement of Work (SOW).

## **Sample Dilutions**

Sample dilutions were performed in order to quantitate analyte concentrations within instrument linear calibration range. All diluted samples were appropriately diluted to accurately quantitate sample concentration.

### Calibration

Instruments are calibration in order to ensure that analytes are correct identified and quantitated. All instrument calibration criteria were met.

A summary of all analytical results, including data qualifier flags and reason codes is presented in Table A-3.

### Completeness

Overall sampling and analytical completeness objectives (90 percent) were met for all analytical methods (see Table A-2(A) and A-2(B)).

<b>TABLE A-2(A)* – SAMPLING COMPLETENESS</b>	
<b>Sample Event</b>	Phytoremediation Monitoring, Naples Truck Stop
<b>Laboratory</b>	EMAX Laboratories
<b>Matrix</b>	Groundwater
<b>Analytical Methods</b>	SW8260B, SW8021, and SW8015M
<b>Sampling Date</b>	April 26, 2000
<b>Total Number of Samples Planned</b>	14
<b>Total Number of Samples Collected</b>	13
<b>Sampling Completeness (%)</b>	93

<b>TABLE A-2(B)* - ANALYTICAL COMPLETENESS</b>	
<b>Sample Event</b>	Phytoremediation Monitoring, Naples Truck Stop
<b>Laboratory</b>	EMAX Laboratories
<b>Analytical Methods</b>	SW8260B, SW8021B, and SW8015M
<b>Sampling Date</b>	April 26, 2000
<b>Total Number of Samples Analyzed</b>	13
<b>Total Number of Results Reported</b>	102
<b>Total Number of Results Accepted</b>	102
<b>Total Number of Results Rejected</b>	0
<b>Analytical Completeness (%)</b>	100

\* Table A-2 does not include TBs and FDs.

### Summary

The data are of acceptable quality and are considered usable to support the U.S. Army Corps of Engineers (USACE), Naples Utah Truck Stop Project. The precision, accuracy, and completeness objectives for this sampling event were met except as previously noted.



TABLE A-3  
NAPLES TRUCK STOP  
APRIL 26, 2000 ANALYTICAL SUMMARY  
LAB #: 00D167

Location	Sample Date UNITS	Benzene ug/L	Toluene ug/L	Ethyl Benzene ug/L	Xylenes ug/L	MTBE ug/L	Naphthalene ug/L	Gasoline ug/L
MW01	26-Apr-00	3.8 J (1T)	ND @ 0.69J (1)	ND @ 0.6J(1)	ND @ 1.4J (1)	100J (1)	ND @ 1.8J (1)	92J (T)
MW02	26-Apr-00	6.1J (1)	ND @ 0.69J (1)	5.7J (1)	ND @ 1.4J (1)	160J (1)	ND @ 1.8J (1)	320
MW03	26-Apr-00	ND @ 0.15	ND @ 0.14	ND @ 0.12	ND @ 0.27	ND @ 0.22	ND @ 0.36	ND @ 12
MW04	26-Apr-00	5.3	1.5	49	74	ND @ 0.22	2.8	640
MW05		NOT COLLECTED						
MW06	26-Apr-00	ND @ 0.15	ND @ 0.14	ND @ 0.12	ND @ 0.27	ND @ 0.22	ND @ 0.36	ND @ 12
MW07		NOT COLLECTED						
MW08	26-Apr-00	18	ND @ 0.69	16	5.6J (T)	210	ND @ 1.8	560
MW09	26-Apr-00	1.2	ND @ 0.14	2.9	ND @ 0.27	ND @ 0.22	ND @ 0.36	180
MW10	26-Apr-00	3500	61J (T)	1300	1319	ND @ 22	ND @ 36	18000
MW10 FD	26-Apr-00	3300J (1)	62 J (1T)	1300J (1)	1200J (1)	ND @ 22J (1)	ND @ 36J (1)	18000J (1)
MW12		NOT COLLECTED						
MW14	26-Apr-00	ND @ 0.15	ND @ 0.14	ND @ 0.12	ND @ 0.27	ND @ 0.22	ND @ 0.36	ND @ 12
MW15	26-Apr-00	ND @ 0.23	ND @ 0.27	ND @ 0.24	ND @ 0.65	ND @ 0.079	NA	ND @ 12
NGMW01	26-Apr-00	ND @ 0.15	ND @ 0.14	ND @ 0.12	ND @ 0.27	ND @ 0.22	ND @ 0.36	ND @ 12
NGMW06		NOT COLLECTED						
VMP01	26-Apr-00	ND @ 0.23	ND @ 0.27	ND @ 0.24	ND @ 0.65	2.9	NA	ND @ 12
VMP02	26-Apr-00	1600	ND @ 6.9	16J (T)	15J (T)	720	ND @ 18	5300
TB	26-Apr-00	ND @ 0.15	ND @ 0.14	ND @ 0.12	ND @ 0.27	ND @ 0.22	ND @ 0.36	ND @ 12

Legend:

NA	not applicable	1	analyzed beyond holding time limit
ND	not detected at method detection limit	T	concentration above MDL but below PQL
FD	field duplicate	MTBE	methyl <i>tert</i> -butyl ether
TB	trip blank	ug/L	micrograms per liter